II. GSSC Development

J.P. Norris

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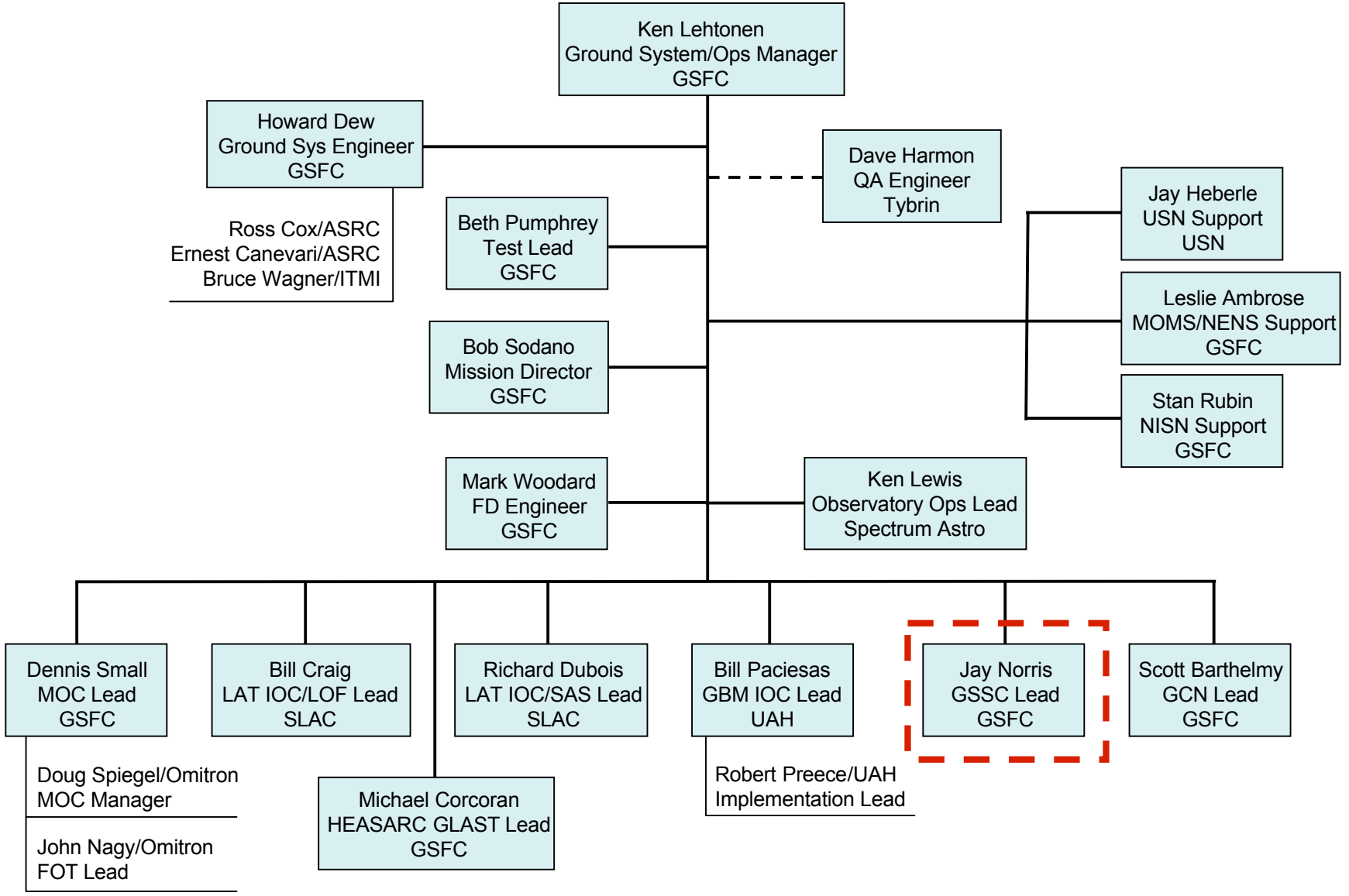
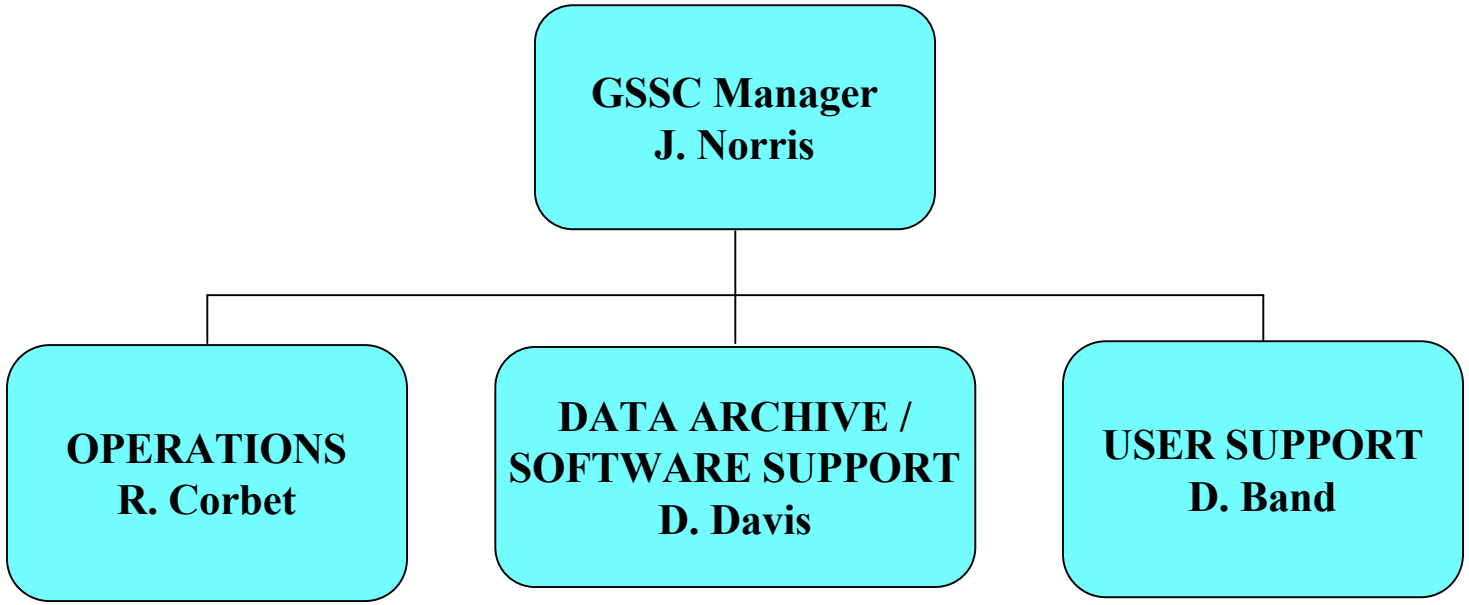
1. Organization / Staff
2. Communications
3. Status of Documents
4. Schedule
   - GSSC SW Releases
   - Ground Readiness Tests
   - Reviews
5. ITAR / EAR

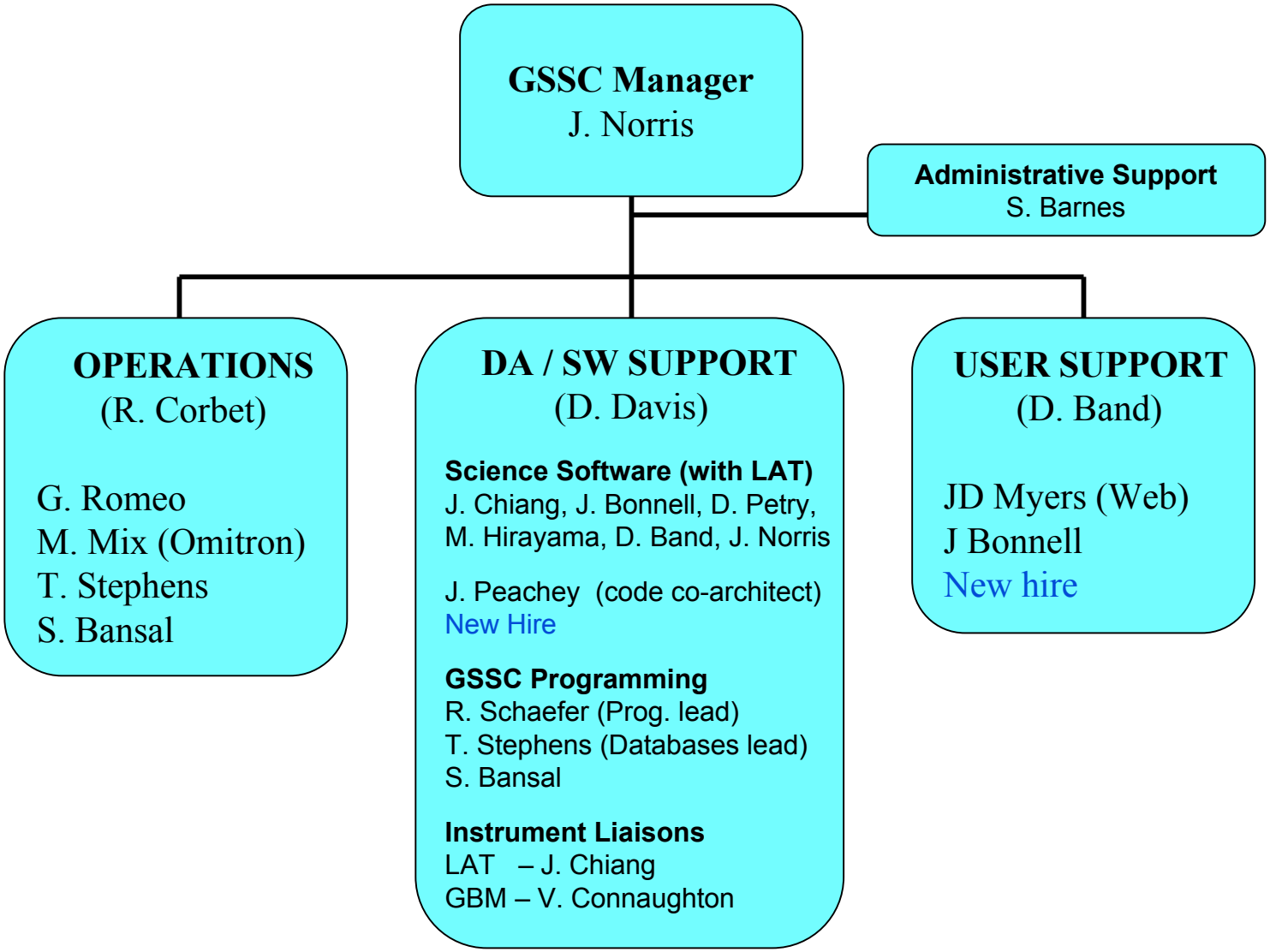
Ground System/Ops Organization



GSSC Organization



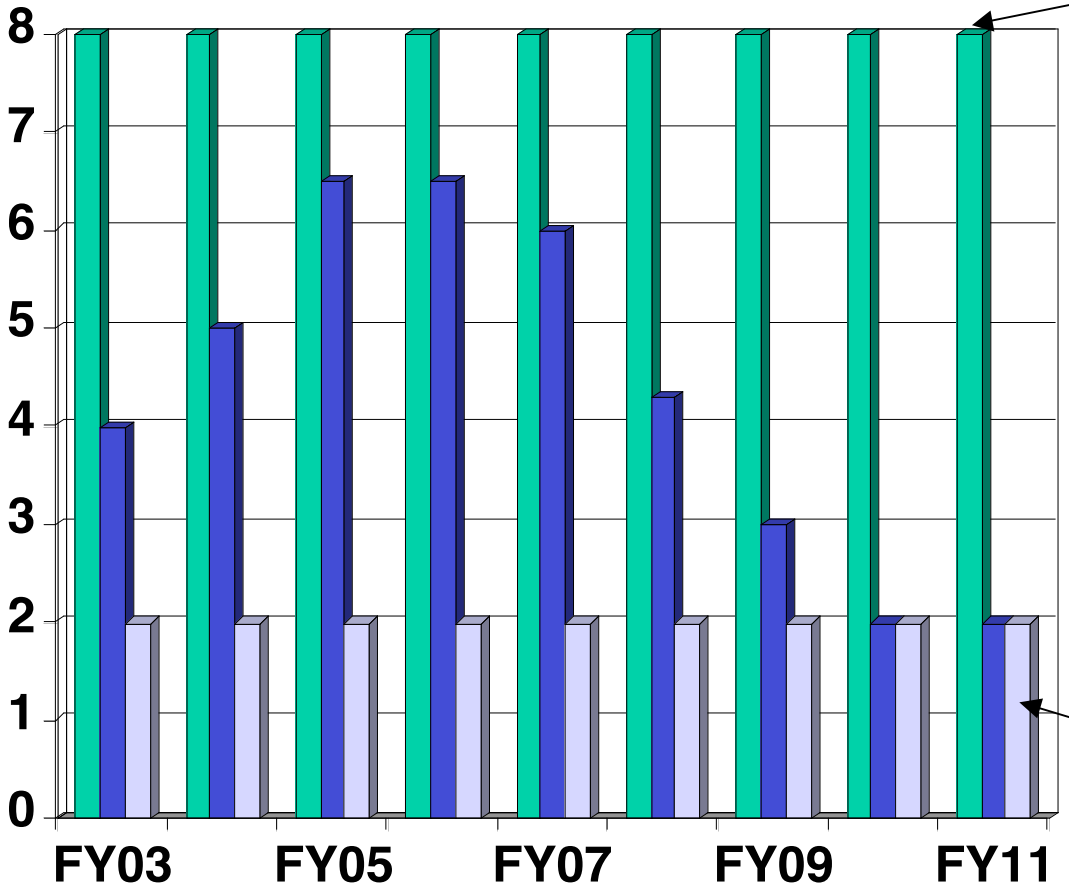
GSSC Organization



GSSC Staff Responsibilities

- Jay Norris — GSSC manager
- Scientists
  - Robin Corbet (75%) — Operations Section Manager
  - Dave Davis — Data Archive / SW Section Manager
  - David Band — User Support Section Manager
  - Masaharu Hirayama — LAT scientist; LAT pulsar tools
  - Jerry Bonnell — CALDB; LAT GRB tools
  - Dirk Petry — Test Manager; Catalogs; LAT science tools
  - Jim Chiang — LAT ambassador (@ SLAC); Likelihood tool
  - Valerie Connaughton — GBM ambassador (@ NSSTC); GBM tools
- Scientific Programmers
  - Bob Schaefer (75%) — GSSC Software Manager
  - James Peachey (75%) — Code Co-Architect (w/ LAT's Toby Burnett)
  - Tom Stephens — SAE & Ops Database Ingest
  - Guiseppe Romeo (50%) — Operations (Tako, Utilities)
  - Marilyn Mix (50%) — Operations (Tako, MOC interface)
  - Sandhia Bansal — Ingest Programmer; GSSC SW; Ops
  - New Hire — C++ Programmer, SAE SW
  - New Hire — User Support (Proposal Tools & Databases)
- Support
  - Sandy Barnes (50%) — Administrative Assistant
  - JD Myers (50%) — Webmaster; User Support

Staffing Profile



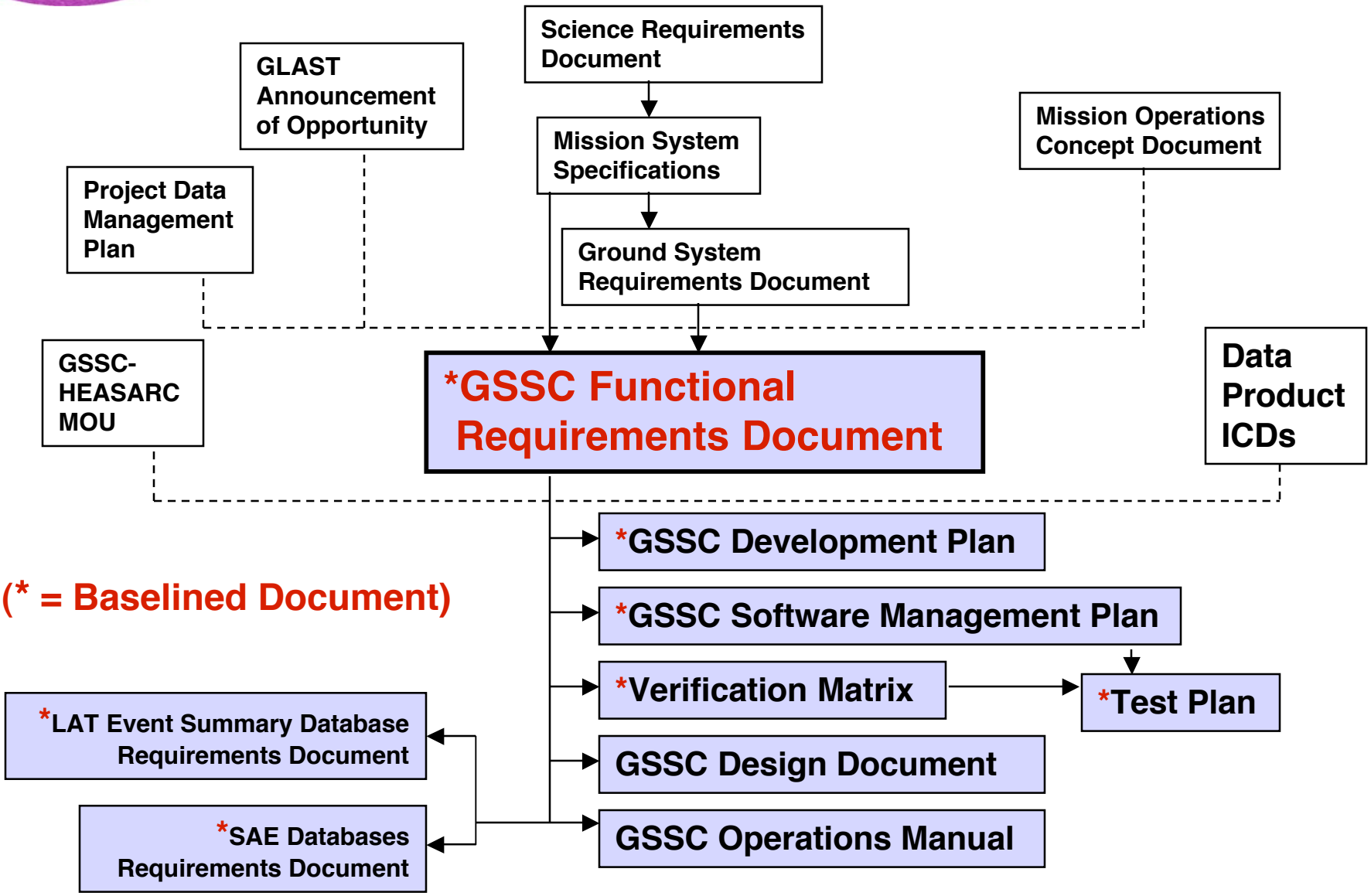
Includes one GSSC scientist at the LAT ISOC and one at the GIOC

Includes support to the GLAST project

GSSC Communications

- Internal communications:
  - Weekly GSSC “meeting of the whole”
  - Weekly Managerial meeting
  - Weekly Software meeting
  - Issues & Action Item lists, maintained by Sections
  - Ad hoc meetings, e-mail
- External communications:
  - Weekly Ground Ops Working Group (GOWG) meetings
  - Weekly VRVS meeting with LAT SAE group
  - Weekly reports to the Ground System/Ops Manager
  - Fortnightly Ftools meeting with HEASARC
  - Monthly GSSC-MOC meetings
  - Monthly meetings with Project Scientist
  - Monthly Project Status Reports (PSRs)
  - Exchange and review of documents
  - Ad hoc meetings, e-mail

GSSC Document Tree



Documents—Status 1

- The GSSC Functional Requirements Document (FRD) is the element-level requirements document. For historical reasons it is maintained at the Project level.
- In response to the ground system development and issues raised at the last peer review (e.g., RFA #8), we revised sections of the FRD:
  - Nomenclature changes (e.g., ISOC, GSSC)
  - Traces to the Ground System Requirements Document
  - GI software
  - Helpdesk (RFA #13)
  - Science timeline/commanding requirements reflect current ops scenario
  - Removed support for Italian mirror site
- In preparing the FRD for CCB, Project's System Engineering evaluated traces to/from higher documents (closes RFA #8).
- The FRD is being submitted to CCB

Documents—Status 2

- The GSSC staff met as an element CCB and baselined:

Development Plan (GSSC-0001)	Test Plan (GSSC-0005)
Verification Matrix (GSSC-0002)	LAT Event Sum. DB Req. (GSSC-0006)
Design Document (GSSC-0003) †	SAE DBs Req. (GSSC-0007)
SW Management Plan (GSSC-0004)	(† scheduled to be baselined July 20)

- Since most of the GSSC's operations are tied to the rest of the ground system, a separate GSSC operations concept document would be overkill; therefore, small additions were (and are still being) made to the Mission Ops Concept Document.

  Staffing is described in the Development Plan (GSSC-0001). An Operations Manual, describing how the GSSC will be operated, will be developed later.

  (These actions collectively address RFA #19, III. Operations)

- The GSSC Design Document is a large document laying out the design and requirements for the various GSSC sub-systems.

GSSC-Relevant Documents

Document	Purpose	Draft	Final	CCB
Project Data Management Plan	**Describes mission's flow of data; includes data policy statement. Maintained by User Support Manager. Reviewed; not signed.**	9/01	10/04	Project
GSSC Functional Requirements Document	**The GSSC's requirements. Written before Ground System Requirements Document; update has not yet been through CCB.**	9/01	10/04	Project
Science Data Products ICD	**Describes the science data products. Based on a 2 year-old working group report. The GSSC is the lead.**	10/03	10/04	Ground System
Operations Data Products ICD	**Describes the operations data products that will be exchanged among the MOC, IOCs and GSSC. The MOC is the lead.**	10/03	10/04	Ground System
GSSC-HEASARC MOU	**MOU establishing mutual GSSC and HEASARC requirements. GSSC is lead.**	9/02	7/04	Ground System
The Standard Analysis Environment for LAT Data	**Defines the tools and software environment for the scientific analysis of LAT data. Developed by GSSC-LAT Software Working Group.**	9/02	3/04 3/05 9/06	LAT team
LHEA IT Security Plan	**Establishes the IT security plan for LHEA**	NA	NA	LHEA

Internal GSSC Documents

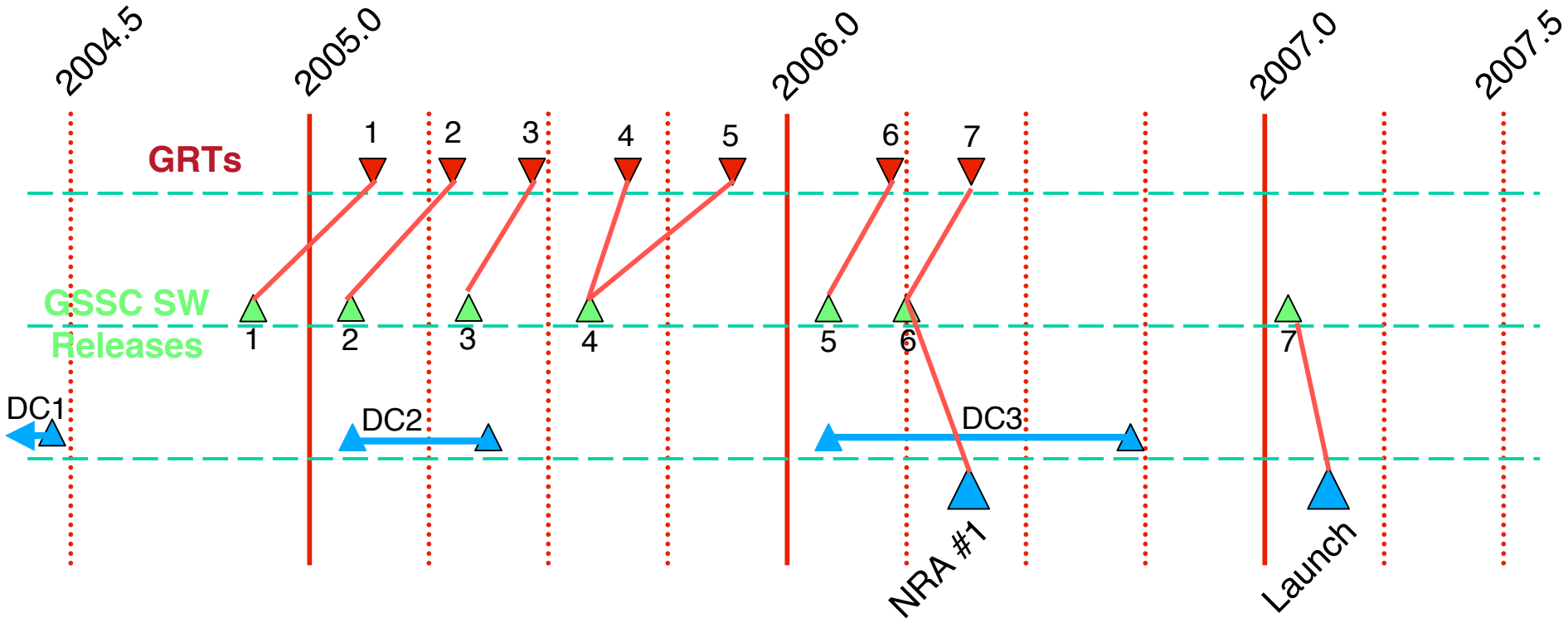
Document	Purpose	Status, Owner
GSSC Development Plan (GSSC-0001)	**Plan for developing the GSSC and its software**	**Baselined 7/04, D. Band**
GSSC Verification Matrix (GSSC-0002)	**Matrix tracking GSSC compliance with its requirements**	**Baselined 7/04, D. Petry**
GSSC Design Document (GSSC-0003)	**Design of the GSSC and its systems. Includes descriptions of hardware and GSSC-specific software**	**Will be baselined 7/04, R. Schaefer**
GSSC Software Management Plan (GSSC-0004)	**Plan for developing and managing the GSSC's software**	**Baselined 7/04, R. Schaefer**
GSSC Test Plan (GSSC-0005)	**Plan for testing GSSC's functions, particularly software**	**Baselined 7/04, T. Stephens**
GSSC Operations Manual	**Plan for the GSSC's operation**	**To be developed for ORR**
LAT Event Summary DB Req. Document (GSSC-0006)	**Requirements for the database from which lists of LAT photons will be extracted**	**Baselined 7/04, R. Schaefer**
Science Tools DBs Req. Document (GSSC-0007)	**Requirements for all other databases associated with the Standard Analysis Environment**	**Baselined 7/04, R. Schaefer**
Informal documents on GSSC internal website: memos, white papers, etc.		

▸ ***These documents are under internal CM.***

Schedules

- The Ground Readiness Tests (GRTs) will test the interfaces throughout the ground system, and are drivers of the development of GSSC's operations subsystems.
- Similarly, the release of the NASA Research Announcement (one year before launch) drives the development of the GSSC GI support subsystems.
- Therefore, we plan 7 software releases — tied to GRTs, GI cycle 1, and launch — implementing the GSSC subsystems.
- In addition, the GSSC supports the LAT effort to meet the SAE software release schedule (discussed in presentations V. & VII.)

Timeline


2004.5
2005.0
2006.0
2007.0
2007.5
GRTs
1
2
3
4
5
6
7
GSSC SW Releases
1
2
3
4
5
6
7
DC1
DC2
DC3
NRA #1
Launch

GSSC Software Releases

- Release 1 (11/15/04) [GRT 1 (02/15/05)]
  - Level 0 HSKP file transfers from MOC
- Release 2 (02/01/05) [GRT 2 (04/15/05)]
  - Commands from IOCs, Timelines to MOC, Project DB from MOC
- Release 3 (05/01/05) [GRT 3 (06/15/05)]
  - BAP Operations, Scheduling Tool, Ingest of integrated scheduling
- Release 4 (08/01/05) [GRT 4 (09/01/05) & 5 (11/15/05)]
  - Operations Planning Tools, Ingest Tools for Levels 1–3 data
- Release 5 (01/31/06) [GRT 6 (03/15/06)]
  - Backup Level 1 pipelines, TOO Tools, GI Support Tools
- Release 6 (04/03/06) [GRT 7 (05/15/06); NRA 1]
  - Ingest Tools for Notifications, SAA Updates, Pulsar Ephemerides; GI NRA Support Tools
- Release 7 (01/15/07) [Pre-Launch Check]
  - Cleanup; Website complete

All expounded upon in subsequent talks.

GSSC Involvement in GRTs—1

- GRT1 (2/15/05)—Supported by SW Release #1 (11/15/04)
  - Connectivity check, MOC ↔ GSSC
  - Ingest Level 0 housekeeping data from MOC
    - Full file transfer, including notifications
    - Ingest into Level 0 archive
    - Send retransmission request
- GRT2 (4/15/05)—Supported by SW Release #2 (2/1/05)
  - Ingest commands and memory loads from IOCs
    - Full file transfer
    - Ingest into databases
  - Send timelines and memory loads to MOC using preplanned timelines
    - Full file transfer
  - Cleanup/regression testing of all capabilities

GSSC Involvement in GRTs—2

- GRT3 (6/15/05)—Supported by SW Release #3 (5/1/05)
  - Support Burst Alert Processor (BAP) operations
  - Integrate IOC commands/memory loads into timeline
    - Repeat ingest from IOCs, transmission to MOC
  - Ingest integrated observatory timeline from MOC
  - Ingest flight dynamics products from MOC
  - Cleanup/regression testing of all capabilities

- GRT4 (9/1/05)—Supported by SW Release #4 (8/1/05)
  - Ingest timeline and memory loads from USN
  - Support BAP operations
  - Cleanup/regression testing of all capabilities

GSSC Involvement in GRTs—3

- GRT5 (11/15/05)—Supported by SW Release #4 (8/1/05)
  - Ingest Level 1, 2 data from IOCs
    - Full file transfer
    - Ingest into databases
  - Ingest as-flown timeline from MOC, compare to science timeline
  - Cleanup/regression testing of all capabilities
- GRT6 (3/15/06)—Supported by SW Release 5 (1/31/06)
  - Operate backup Level 1 pipelines
  - Send TOO order to MOC
    - Create order
    - Transmit
    - Exchange notifications
  - Ingest anomaly reports from MOC
    - Full file transfer
    - Ingest into database
  - Cleanup/regression testing of all capabilities
- GRT7 (5/15/06)—Supported by SW Release 6 (04/03/06)
  - Cleanup/regression test all capabilities

Reviews Relevant to GSSC

- Ground System Requirements Review (7/03)—Provided the driving requirements for the ground system and the operational design within which these requirements were derived.
- GSSC Peer Review (11/03)—Demonstrated that GSSC design is at PDR level.
- GSSC Detailed Design Peer Review (7/04)—Demonstrate that GSSC design is at CDR level.
- Ground System Design Review (8/18-19/04)—Demonstrate that the requirements, interfaces and design are of sufficient maturity to begin ground system development.
- Mission Operations Review (10/05)—Schedule and approach for achieving operational readiness.
- Operational Readiness Review (12/06)—Launch readiness of the Ground System.

ITAR/EAR (RFA #11)

- Basic principle: we will adopt the policies of sister organizations in the ground system and the OGIP.
- The GSSC designs for command-passing and scientific timeline construction involve spacecraft commands and capabilities, raising ITAR/EAR concerns. We will implement the ground system policies, e.g., websites throughout the ground system that provide design information will be password-controlled, with access limited to the appropriate audience.
- ITAR/EAR issues in serving the scientific community with data and analysis software are the same for all missions. We will implement the ITAR/EAR policies of the OGIP. We will certify that scientific data are being released, and that it is impossible to replicate the spacecraft from the released data.